A retrospective analysis of the costs and consequences of a tobacco-cessation program for active duty service members


Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Tobacco cessation programme involving transdermal nicotine replacement therapy (TNRT) in conjunction with behavioural modification.

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
125 active-duty service members (either Air Force or Air National Guard members) enrolled in a tobacco cessation programme. The mean age of programme participants was 31.19 (+

Setting
Community (Davis-Monthan Air Force Base). The economic study was carried out in Arizona, USA.

Dates to which data relate
Effectiveness and resource data were from the period 1993-94. Prices also related to resource costs associated with this period.

Source of effectiveness data
Derived from a single study.

Link between effectiveness and cost data
Effectiveness and cost data were collected from the same patient sample, and both sources of data were collected at the same time retrospectively.

Study sample
126 active-duty service members. The inclusion criteria included:

being tobacco users;

having at least one prescription for TNRT;
being officially registered in the programme through the Health Promotion Clinic;

and, participation in the programme during the specified period.

No mention was made of sample size calculations, although it was stated that the sample size was sufficiently large that a normal approximation of the distribution of the proportions was assumed.

**Study design**
Case series (before-after) study carried out at a single centre. The intervention lasted 12 weeks and each subject was followed up at 3 and 6 months after entry into the programme. Tobacco use assessment was obtained from 61% of the participants at 3 months, dropping to 57% at 6 months. Responses at both 3 and 6 months were collected from 48% of participants.

**Analysis of effectiveness**
Analysis was based on intention to treat. No health outcomes were used in the analysis, only intermediate outcomes such as tobacco abstinence.

**Effectiveness results**
Participants received an average of 2.84 (+/- 1.46) prescriptions for TNRT. Tobacco abstinence, determined by 6-month point prevalence abstinence (PPA), was 19.05%, and 15.08% for 6-month continuous abstinence (CA). PPA and CA rates were statistically significantly higher than expected (p<0.002 and p<0.02, respectively) i.e. the rate of 9% derived from the literature. No significant differences occurred in the mean duration of TNRT between current and former tobacco user groups for each of the 6-month PPA (2.83 vs 2.88) and CA (2.82 vs 2.95) assessments.

**Clinical conclusions**
The results indicated that the programme was effective in producing abstinence from tobacco use at 6 months after entry into the programme (19% for PPA and 15% for CA). Both abstinence rates were significantly greater than the expected 6-month abstinence rate of 9% derived from the literature. The optimal duration of TNRT remains in question, since no significant differences in duration of TNRT were identified between the groups abstinent and not abstinent from tobacco use at 6 months after entry into the programme.

**Measure of benefits used in the economic analysis**
The intermediate outcome measure used in the economic analysis was the abstinence rate (i.e number of successful outcomes).

**Direct costs**
The resources used and costs of the programme were evaluated from the perspective of the Department of the Air Force and included the cost of the educational materials, the cost of class facilitators, and the TNRT cost. The quantity of resources was measured for the period 1993-94. The study compared incremental, marginal, and average costs of providing an increased duration of TNRT.

**Currency**
US dollars ($).

**Sensitivity analysis**
One-way sensitivity analyses were performed by varying the proportion of successful outcomes. Analyses were performed on cost effectiveness ratios and different levels of TNRT intensity.
Estimated benefits used in the economic analysis
6-month PPA was 19.05%, while 6-month CA was 15.08%.

Cost results
The total operational costs of the programme during the 12-month study period were $18,694.43. The total costs were made up of educational material costs ($147.42), facilitator costs ($7,548.00) and TNRT costs ($10,999.01).

Synthesis of costs and benefits
Average operational cost per successful outcome at 6 months after entry into the programme were $778.93 using PPA and $983.92 using CA. Additional analyses revealed corresponding increases between average cost per successful outcome and duration of TNRT. When considering only TNRT costs, the average cost per successful outcome was $458.29 using PPA, and $578.90 for CA. The marginal and average cost per successful outcome increased with longer duration of TNRT, suggesting that the cost to achieve additional success became more expensive with the longer duration of TNRT.

Authors' conclusions
The results indicated that the programme was effective in producing abstinence from tobacco use at 6 months after entry into the programme, despite using very conservative definitions of tobacco abstinence and relatively aggressive estimates of expected tobacco abstinence for comparison groups. The optimal duration of TNRT remained in question. This research provided an initial analysis of the efficiency of the programme for active duty participants as well as a model for subsequent evaluations within military medical treatment facilities. Future evaluations must be conducted to establish the reliability and validity of this approach so that the most efficient programme for active duty service members can be identified.

CRD Commentary
As the authors pointed out, the targets of this study were fairly modest and they stressed the need for a well-designed prospective study to confirm the promising findings of this project. This study is a useful benchmark for future projects but it has a number of important limitations. Firstly, there was no randomly selected control group, which severely weakens the conclusion that the relatively high abstinence rates can be attributed only to the effects of the cessation programme. They are deemed to be relatively high in comparison with a figure of 9% which was derived from a meta-analysis of 17 nicotine patch studies. However, the population from which this figure was drawn is unknown and is likely to be completely different from the specialist population in this sample. Also, the study design was retrospective, and, like most health promotion projects, was subject to both self-report bias and self-selection bias (i.e. those taking part are more likely to want to give up smoking than non-participants).

Implications of the study
Given the high levels of morbidity, mortality and costs associated with smoking, the implications of any cessation programme that claims significantly to increase abstinence rates will have enormous implications. However, due to the limitations outlined in the previous section, reliance on the results of this study alone is not recommended, particularly due to its specialist population and questions about its generalisability to the NHS setting in the UK. Future research is required in wider settings.

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